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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,000	12/29/2000	Sadao Hirae	P/1596-51	9450

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OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER

WINTER, GENTLE E

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 12/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/751,000

Applicant(s)

HIRAE ET AL.

Examiner

Gentle E. Winter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-12, 17 and 25-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-12, 17 and 25-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/26/03 has been entered.
2. Currently pending are claims 9-12, 17, 25-28.

Response to Amendment

Claim Objections—Withdrawn

3. Claims 11-12, and 27-28 were objected to for failing to further limit the subject matter of a previous claim. Applicant amended the claims to recite a structure for performing the claimed function. The objection is withdrawn. The expression “cleaning solution supply means” has been defined in the specification as “[t]he nozzle 7, pipe 15, control valve 19 and ozone water feeder 21”.

Claim Rejections - 35 USC § 102—Maintained

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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1. Claims 1, 3, 5, 7, 9, 11, 17, 19, 21, 23, 25, and 27 were rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,464,480 to Matthews. Claims 1, 3, 5, 7, 19, 21, and 23 are cancelled. Claims 9-12, 25, 27, and 28 have been amended. Claims 9-12, 17 and 25-28 are pending.

2. Applicant remarked:

Moreover, with respect to the apparatus claims, they have been rendered in "means plus function" format, wherein the recited function defines the structure by reference to the specification. It is believed that in that form, the function itself becomes part of the structure and the Examiner must give full consideration to the actual words of the claims which describe the function.

Applicant's comment is consistent with this examiner's perceptions and believed to be consistent with Office policy. This examiner makes every effort to give full consideration to all arguments, to all the words of the claims, and to the all other material that makes up the prosecution history. However, this is not to say that substantive *weight* will be accorded to *all* the material that makes up the prosecution history. Means plus function language allows an applicant to claim a structural element by its function rather than by its structure. This however does not permit the examiner to give weight to the future intended use, weight is accorded to the structure that would follow from a means that would perform the recited function.

Particularly as amended herein each of the claims generally covers a substrate treating apparatus which includes several distinct structural elements.

A first one is a support means ***

A second one is a solution supply means ***

Thirdly, an ultraviolet emitting means ***

If applicants invention relates to the chemical compositions and the species that are formed on a substrate surface applicants may elect to pursue a divisional application that claims the method. In such a case, weight is accorded to active steps, not the result obtained. The results follow from the steps. It goes without saying that obtained results are neither structural components nor

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method steps. If Applicant should substantively amend the claims, and the resulting inventions require separate searches the application will be restricted. To date the application has not been restricted because there has not been an undue burden on the examiner in searching the claims.

It is noted that claim 9 would be distinguished over by United States Patent No. 5,464,480 to Matthews if the claim were to positively recite a means for spinning a substrate. The current means is a supporting means. A claim limitation will be interpreted to invoke 35 U.S.C. 112, sixth paragraph if it meets the following 3-prong analysis:

- (A) the claim limitations must use the phrase “means for” or “step for”;
- (B) the “means for” or “step for” must be modified by functional language;
- and
- (C) the phrase “means for” or “step for” must not be modified by sufficient structure, material or acts for achieving the specified function.

Claims 9, 11, 12, 25, 27, and 28 fail to comply, at least, with part C. Specifically, “support means for supporting” and “an ultraviolet emitter means for emitting ultraviolet light”.

Similarly, a “cleaning solution supply means” to supply cleaning solution fails to invoke 35 U.S.C. § 112 sixth paragraph. Nonetheless, in the interests of compact prosecution it will be assumed that the only issue is one of form, and that the intent was to add a means for spinning to claims 9 and 25. If this structural component is added, the rejection in view of Matthews will be withdrawn, as Mathews apparently does not include this limitation. The rejection is maintained as a formality, pending the above-indicated clarifications to claim 9 and 25.

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As to claims 10 and 26, this examiner wants to remove any ambiguity as to how these claims are being construed. The wavelength is NOT the limitation that is accorded weight, rather the means for producing the wavelength (presumably a bulb), predominately in the indicated wavelength, is the source of the structural limitation. As was previously indicated, virtually all sources of electromagnetic radiation emit in the claimed range. The claim is construed to read on a means that predominately emits in the claimed range.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 9-12 and 25-28 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,364,980 to Tomita “Tomita”.

Claims 9-12 and 25-28 are drawn to a substrate treating apparatus comprising a support means for supporting and spinning a substrate; a cleaning solution supply means having a nozzle for supplying a cleaning solution having ozone dissolved therein to said substrate; an ultraviolet emitter means for emitting UV light to said substrate; and during a cleaning process in which said cleaning solution supply means to said substrate supported and spun by said support means, said ultraviolet emitting means emits UV light to said cleaning solution supplied to said substrate and forming a puddle on an upper surface of said substrate. A UV light source is construed to be

claimed in claim 10, see discussion above.

Structurally the same is disclosed in Tomita at column 1, line 61 *et seq.* Tomita discloses a technique for inhibiting the re-deposition to a certain extent, wherein there is a spin washing step via a spin washer, wherein a “washing solution is sprayed onto the substrate held on a rotary block, the washing liquid is perpetually scattered under the centrifugal force”. Additionally disclosed is “rinsing with pure water *** by spraying pure water in the course of the treatment in substitution for the washing liquid, whereas drying may also be achieved by continuing the rotation of the substrate while the supply of pure water is stopped. The washing apparatus described in, for example, the JP Patent Kokai Publication No. 63-15710 (1988) is directed to the spin washing. However, the washing apparatus is bulky in size since it is provided with a mechanism for optical washing by irradiation of UV rays after the termination of the spin washing.”

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 9, 11, 17, 25, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 5,464,480 to Matthews. Regarding claim 17, the instant application claims a method for substrate cleaning, including the steps of supplying an ozone containing treating solution to the substrate and irradiating the cleaning solution with ultraviolet light. It is noted that the sequence of the steps is not specified. Thus, no limitation regarding a step

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sequence will be assumed. This is the case because applicant has been specifically made aware of this issue and has not elected to clarify, without ambiguity that the sequence of steps is critical. If applicant would like the sequence of steps to be considered as a limitation applicant should amend the claim to make the same explicit.

4. Matthews discloses a substrate treating method that utilizes a tank, fitted with ultraviolet light source, for subjecting a cleaning solution to UV radiation (column 10, line 3 *et seq.*).

Further, the UV source is disclosed as being mountable on the outside of the tank or, preferably, is submerged into the tank and placed over diffuser, as shown at 3 in FIG. 1 and FIG. 2. The UV light is disclosed to have utility as a means for generating oxygen free radicals and oxygen molecules from ozone bubbled directly into the treatment tank for removal of organic materials on wafer during operation of the disclosed ozonated water process.

5. The formation of the oxygen radical, which is described in Matthews, would have required the instantly claimed wavelength. (See also claims i.e. claim 12).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 10 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Matthews, as discussed above, in view of United States Patent No. 6,403,498 to Matsuo et al.

Each and every limitation of claims 10-12 and 26-28 are identically disclosed in Matthews, as set

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forth above, except that Matthews et al. apparently fails to explicitly disclose the presence of a UV light source having a wavelength between 242.4 and 300 nm. It is noted that such a disclosure is necessarily inherent. Absent such an element, the system seemingly would not function. However, in the interests of compact prosecution, a secondary reference is provided to make explicit, that which is implicit in Matthews. Matsuo et al. disclose a processing chamber and a lamp chamber that are insulated from each other by a shutter. When the shutter is opened, the processing chamber is connected to the lamp chamber, such that an ultraviolet ray from the lamp is irradiated onto the substrate. When the lamp is turned on, a main ultraviolet ray having a wavelength of 254 nm and a subordinate ultraviolet ray having a wavelength of 185 nm are emitted. The artisan would have been motivated to use UV emitting source of Matsuo et al. in the Matthews invention, because absent such an element the UV facilitated reactions would not occur. Further, it is noted that the basic chemistry of UV induced radical oxygen production, is well known in the prior art of record. It is noted that Applicant, seemingly had to rely on such a source in order to provide the equations on page 8. See also the thesis of Matthew J. Harris, disclosing the indicated wavelengths, and disclosing that the UV induced chemistry was known since the 1930's, and providing the motivation for selecting such wavelengths if practicing the invention of Matthews.

Conclusion

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gentle E. Winter whose telephone number is (703) 305-3403. The examiner can normally be reached on Monday-Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703) 308-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. The direct fax number for this examiner is (703) 746-7746.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Zeinab Elarini

Gentle E. Winter
Examiner
Art Unit 1746

**ZEINAB EL-ARINI
PRIMARY EXAMINER**

December 13, 2003